

INVITATION TO PARTICIPATE IN THE FTA APTS MOBILE SHOWCASE PROGRAM

Summary:

The United States Department of Transportation announces its intention to develop and showcase a transit bus equipped with Intelligent Transportation Systems (ITS) displays. The development and demonstration of the transit bus and associated ITS equipment is known as the Advanced Public Transportation Systems (APTS) Mobile Showcase Program (the Mobile Showcase or the Program). The Program is a partnership between the government and the transit industry. Transit vehicle and ITS/APTS equipment manufacturers, suppliers, and vendors interested in becoming partners in the Program, by providing vehicles, equipment, and technical assistance, are invited to submit letters of interest and proposals as described under Instructions to Potential Partners, below. The Program, which is planned to continue from two to five years, is explained in detail in the attached APTS Mobile Showcase Program Plan (Program Plan). The vehicle and technologies making up the Mobile Showcase will be exhibited at major transportation conferences, at transit agencies, and at other transportation venues around the country.

The Mobile Showcase will demonstrate equipment designed to improve transit safety, service, and cost effectiveness. ITS/APTS technology may be designed for use on a transit vehicle or at stops or other “off-bus” locations. Equipment that cannot be included in the display bus may be demonstrated in kiosks or by means of videotapes or computer displays.

Goals of the Program:

The overall goals of the Mobile Showcase Program are to promote research, development and deployment of APTS technologies and to support the continued development of transit industry integration standards. In furtherance of these goals, the Mobile Showcase will provide an opportunity to demonstrate to the transit community, particularly transit operators, elected officials, transit board members, senior management, and operation and maintenance management and staff, the applicability of advanced ITS technologies, how the technologies can work together, and what benefits can be derived once they have been installed and are fully operational.

The Mobile Showcase Program will also create a collaborative research and development opportunity for the Government and transit vehicle, equipment and technology manufacturers, suppliers, and vendors to identify barriers to integration of equipment, and evaluate ways to overcome those barriers.

CRADA Partnership

The Volpe National Transportation Systems Center (Volpe Center) of the Research and Special Programs Administration, in support of the Federal Transit Administration (FTA), will enter into a Cooperative Research and Development Agreement (CRADA) with each entity selected for participation in the Mobile Showcase Program. The CRADA will define roles and responsibilities for both the Government and private sector partners. A sample CRADA is included in Appendix Three of the APTS Mobile Showcase Program Plan (Program Plan) found at Attachment A. Note that under a CRADA, the Government is prohibited from providing funds to a non-federal party participating in the project.

PRE-PROPOSAL INFORMATION MEETING

A Pre-Proposal Informational Meeting will be held on Wednesday, February 17, 1999, at 1:00 PM, at:

Holiday Inn Capital
550 C Street, SW
Washington, DC 20024
202-479-4000

The purpose of the meeting is to allow potential participants to ask questions of the government regarding the APTS Mobile Showcase Program. The Government will accept written questions submitted by 5:00 PM EST, Friday, February 12, 1999, which will allow time for the Government to formulate its responses. Oral questions will be addressed at the meeting after responses to the written questions are provided. Written questions should be e-mailed or faxed to:

Matthew Rabkin
APTS Mobile Showcase Program Manager
rabkin@volpe.dot.gov
617-494-3260 (fax)

Relevant information from the meeting will be provided to all recipients of the invitation to participate in the APTS Mobile Showcase Program.

INSTRUCTIONS TO POTENTIAL PARTNERS

As CRADA partners in this project, transit vehicle and equipment manufacturers and vendors will provide equipment and technical assistance for the Mobile Showcase. Manufacturers and vendors interested in participating are asked to identify the vehicle or technology to be demonstrated, to provide complete technical specifications, as well as information regarding installation and maintenance of the equipment, and to state how Mobile Showcase staff will be trained in the operation and routine maintenance of the equipment. Interested manufacturers and vendors should also provide information on additional resources and support that may be available to the project.

Submission of proposals

Those persons interested in participating as partners in the Mobile Showcase Program should send six hard copies of their proposal and one electronic copy in IBM compatible/Windows versions of MS Word or WordPerfect format on a 3.5" diskette (technical specifications, and brochures need not be submitted in electronic format) to the following:

Matthew Rabkin
APTS Mobile Showcase Program Manager
US DOT/ Volpe Center, DTS-49
55 Broadway
Cambridge, MA 02142
(617) 494-2151

Any proprietary and confidential data submitted to the Government with your proposal should be clearly identified as such. Properly labeled proprietary and confidential data will be held in confidence and used only for the purposes for which it is provided.

To be considered for the initial round of CRADAs, letters of interest must be received by the above on or before 4:00 p.m. EST on Friday, March 12, 1999. However, the Government reserves the right to solicit and accept additional participants at later dates for purposes of enhancing or updating the Mobile Showcase.

General

The Evaluation Criteria which the Government will use in determining which equipment and technology are to be included in the Mobile Showcase are detailed in Attachment B. In preparing your proposal, you should provide sufficient information to enable the evaluators to make an informed decision based on these criteria.

Your letter of interest should provide the required detail, but legibility, conciseness, clarity and brevity are important since they will facilitate the Government's evaluation.

Signatories and Points of Contact

Letters of interest shall be signed on the first page by an individual with power to bind the offeror.

A Point of Contact (POC) with authority to answer questions and negotiate with the Government shall be identified on the first page, together with an address, telephone number and FAX number, and email address (where available), at which the POC can be reached.

Page Limits

Your response should be prepared on standard 8.5 x 11 inch paper, numbered and printed single-sided, with font no smaller than 12 point. The page limit for your proposal in response to this invitation is 11 pages total including a one page transmittal letter/summary of your proposal. The material addressing the evaluation criteria shall be clearly related to the specific criterion being addressed by using the evaluation criterion number (e.g., 3.1 for the "Training" criterion under 3.0, "In-Kind Contribution to Program."). Technical specifications and descriptive brochures are not subject to the page limit.

EQUIPMENT AND TECHNOLOGIES SOUGHT

The Mobile Showcase Platform

The Government is seeking proposals offering use of at least one 40-foot, low-floor diesel-electric hybrid transit bus as a platform for the Mobile Showcase. The bus will be converted to be an interactive, participatory learning environment. Buses using other fuels and configurations will also be considered. Provisions must be made to enable disabled persons to access the vehicle when in display mode. Because the vehicle may sometimes be driven from site to site, and will likely be driven in demonstration mode, the fuel it uses should be readily available across the country and should not impose serious restrictions on where it can be driven and displayed. The desired features of the vehicle and its proposed use are described in detail in Appendix One to the Program Plan.

Mobile Showcase Technology Displays

The Government is seeking proposals from equipment manufacturers and vendors for various APTS technologies, to be exhibited both in operation and in non-operational displays. Integrated equipment and exhibits will be changed on a regular basis to ensure that the latest technologies are being exhibited and to demonstrate offerings from a broad spectrum of participants.

A non-exclusive list of technologies that may be demonstrated and displayed in the Mobile Showcase is included in Appendix Two of the Program Plan. The desired technologies cover service, safety and security, fare collection and passenger counting, operation and passenger information, and communications. One of the most important elements of the program is demonstrating how these different technologies, coming from different vendors, can be integrated into a single system. Since the Mobile Showcase will serve to both show the industry that technologies can be integrated and to identify barriers and issues related to integration and interoperability, proposals should describe what will be required to integrate the proposed equipment with that of other vendors. This is particularly important because the Government intends to rotate equipment on and off the bus to enable many manufacturers to participate.

Operation and Maintenance

Partners providing equipment for display on the Mobile Showcase will be expected to provide training to the Mobile Showcase staff in operation and general maintenance of their equipment. Manufacturers and vendors interested in participating are asked to provide technical information regarding installation and maintenance of the equipment, and state how Mobile Showcase staff will be trained in operation and routine maintenance.

CONTENTS OF THE PROPOSAL

A. Letter of Interest. At a minimum, the letter will identify the name of the company(ies) submitting the proposal and summarize the proposal contents.

B. Technical Information

Transit Bus Platform

Identify and describe each bus proposed as a platform for the Mobile Showcase operational demonstrations and the extent to which it will meet the needs of the program. Provide complete technical specifications for the proposed vehicle.

Describe any modifications necessary to enable the bus to meet the goals of the program and indicate whether such modifications will be provided and how long they are anticipated to take.

State whether the bus conforms to the requirements of the Americans with Disabilities Act, as amended, 42 U.S.C. §§12101 *et seq.*.

How soon will the bus be available? Will the bus remain available for the five-year maximum period of the program?

Equipment and Technology

Identify the equipment and technology proposed for inclusion in the Mobile Showcase. Explain how it will meet the goals of the program: to promote and demonstrate cutting-edge APTS technologies; to research and demonstrate technology integration issues; and to evaluate the need for transit industry integration standards.

Provide detailed technical specifications. Include descriptive brochures if available.

State whether or not the product meets national architecture standards. State whether the equipment meets the “Buy America” requirements of 49 C.F.R. Part 661 for equipment produced in the United States.

Discuss the probable ease of integration of the equipment or technology proposed with equipment from other manufacturers and vendors and estimate how much effort will be required to effect such integration.

State the current availability of the proposed products. If the proposed equipment is other than proven “off-the-shelf” technology, describe what support will be available to ensure its reliability.

Describe any proposal for technology refreshment or “change-out” during the term of the Mobile Showcase.

Describe any limitations such as type of use, or length of time, that may apply to any equipment or technology proposed for the program.

C. Other Terms

In-Kind Contributions

Describe the extent of your commitment to provide training, support, or staff assistance to the Mobile Showcase.

Describe any educational or descriptive materials or exhibits you will provide for use in the Mobile Showcase.

Describe any other in-kind contributions you are willing to provide.

Financial Contributions

Describe the extent of any financial contributions you are prepared to commit for the support of the Mobile Showcase over the three to five year project life.

Background, Business History and Financial Capability

Please provide sufficient background and financial information to allow the Government to determine whether your firm has the capability to fulfill its proposed commitment to the program for three to five years. The amount of information necessary will depend on the nature of the equipment or technology proposed.

Acceptance of the CRADA

Are there any terms of the draft CRADA which you would be unwilling to accept? If so, please explain your objection.

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The Volpe Center is using electronic commerce to issue this Invitation and amendments to this Invitation. These documents will be available on a WWW server which may be accessed using Web browsers. The WWW address, or URL, of the Volpe Center Acquisition Division home page is: <http://www.volpe.dot.gov/procure/current.html>. Potential Partners desiring to receive electronic notification of the solicitation's posting and availability for downloading may register at the Volpe Center site. Potential Partners are warned that when they register to receive solicitations, amendments and other notices, the responsibility for providing the Government with an accurate and complete e-mail address lies with the contractor. The Government will make no additional efforts to deliver information when the system indicates that transmissions cannot be delivered to the e-mail address provided.

The contents of the two attachments to this invitation will be posted on the Volpe Center's acquisition Web page at <http://www.volpe.dot.gov/procure/current.html> as well as FTA's Web page. If you do not have access to the Web, please submit to Matthew Rabkin a written request via fax ((617) 494-3260) or letter at:

Matthew Rabkin
US DOT/ Volpe Center, DTS-49
55 Broadway
Cambridge, MA 02142

Attachment A – APTS Mobile Showcase Program Plan

Attachment B – APTS Mobile Showcase Program Evaluation Criteria

APTS Mobile Showcase Program Plan February 1999

Prepared by:

APTS Mobile Showcase Program Team
Volpe National Transportation Systems Center
US Department of Transportation
Kendall Square
Cambridge, MA

Prepared for:

Office of Mobility Innovation
Office of Research, Demonstration and Innovation
Federal Transit Administration
Washington, DC

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Acronym Guide

AC	Alternating Current
ADA	Americans with Disabilities Act
APC	Automatic Passenger Counter
APTA	American Public Transit Association
APTS	Advanced Public Transportation Systems
AVL	Automatic Vehicle Location
CFR	Code of Federal Regulations
CAD	Computer-Aided Design
CD	Compact Disk
CDPD	Cellular Digital Package Data
CID	Card Interface Device
COS	Card Operating Standards
CPU	Computer Processing Unit
CRADA	Cooperative Research and Development Agreement
CTAA	Community Transportation Association of America
DC	Direct Current
DGPS	Differential Global Positioning System
DOT	Department of Transportation
DVD	Digital Video/Versatile Disk
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
FTP	Fare-card Transaction Processor
GIS	Geographic Information Systems
GPS	Global Positioning System
HVAC	Heating, Ventilation and Air Conditioning
ISO	International Standards Organization
ITS	Intelligent Transportation Systems
IVI	Intelligent Vehicle Initiative
LORAN-C	Long Range Aid to Navigation
NFPA	National Fire Prevention Association
PCMCIA	Personal Computer Memory Card International Association
RF	Radio Frequency
SAE	Society of Automotive Engineers
TRB	Transportation Research Board
U.S.C	United States Code
UL	Underwriters' Laboratory
VAC	Volts Alternating Current
VAR	Value-Added Reseller

1.0 Executive Summary

The APTS Mobile Showcase Program will demonstrate and display state-of-the-art proven transit technology and will serve as a platform for researching and evaluating integration of advanced technologies. The platform will be a transit bus converted for use as a display area for technologies provided by manufacturers, suppliers, and vendors of transit equipment. This Program a partnership between the Federal Transit Administration (FTA), the US DOT Volpe National Transportation Systems Center (Volpe Center), bus and equipment manufacturers, suppliers, and vendors, transit agencies, and consultants.

The APTS Mobile Showcase Program's mission is to promote the development and deployment of transit ITS technology that will improve transit safety, operations, and cost-effectiveness. The Mobile Showcase Program will accomplish this by providing a platform for demonstrating the latest proven technologies and for researching ITS technology integration issues and supporting the continued development of transit industry integration standards. The Mobile Showcase will use proven state-of-the-art technologies for its mission. Opportunities for demonstrating and researching prototype technologies may also be provided.

The primary audiences for the Mobile Showcase are transit agencies (transit authority board members, senior staff, technicians) and the manufacturers, suppliers, and vendors of transit technology. The Mobile Showcase will also highlight technologies to other interested individuals and organizations including elected officials, academia, the media, and the general public.

The platform for the Mobile Showcase will be a transit bus. The desired vehicle is a 40-foot transit bus that is handicapped accessible, such as a low-floor bus. The interior of the bus will be designed to allow for demonstration of a variety of technologies.

The Mobile Showcase will demonstrate proven new transit technologies. Some of the items demonstrated will be traditional "high tech" APTS/IVI¹/ITS technologies. The types of proven technologies range from those that improve operations, such as automated vehicle location (AVL) systems, improve communications, such as mobile data terminals, improve passenger service, such as real-time information kiosks, and improve safety such as pedestrian detection technologies. Low-tech technologies such as stain resistant seats and vandal resistant windows may also be included.

¹ US Department of Transportation Intelligent Vehicle Initiative

It is hoped that a large number of technology manufacturers, suppliers, vendors, and consultants will be interested in participating in this Program. The number of technologies and products that can be displayed at a given time will be limited, however. This does not mean that information cannot be provided on a large number of products. The first level of participation, willingness to be a partner in this Program, would allow a partner to be identified as a vendor of a technology. This opportunity will be open to any manufacturer or vendor of a technology identified as being appropriate for this Program. Vendors and manufacturers would meet only minimal requirements for participation at this level.

Display and integration of technologies will require a greater commitment by partners. A partner would have to provide a piece of technology and train Mobile Showcase staff in how the technology works, in order for staff to demonstrate the technology, and how the technology is maintained. If a technology will be demonstrated as an operational component of the Mobile Showcase, the manufacturer or vendor would commit to working with Program staff to integrate the technology into the bus and with other technologies.

The US Department of Transportation's Volpe National Transportation Systems Center (Volpe Center) manages the Program for the FTA. Volpe Center staff will be responsible for scheduling the Mobile Showcase, negotiating terms of participation, working with partners, and overseeing installation of equipment. Mobile Showcase staff must be knowledgeable about both the types of equipment demonstrated on the bus and the specific technologies installed for demonstration purposes.

The selection of these private sector firms must depend on their willingness to work with the Program Team in the preparation of displays that will communicate with many different segments of the transit community, and to conform to a predetermined story line. Also, the participants must be willing to design "sets" that can be easily installed and then disassembled. Complete information about participating in the Mobile Showcase Program is included in an Invitation to Participate in Cooperative Research and Development agreements. A copy of this invitation is available through the Commerce Business Daily (web and hardcopy), the FTA web page (www.fta.dot.gov), or by contacting Matthew Rabkin, Mobile Showcase Program Manager, at:

US DOT
Volpe National Transportation Systems Center
55 Broadway, DTS-49
Cambridge, MA 02142
e-mail: rabkin@volpe.dot.gov
fax: 617-494-3260
voice: 617-494-2151

2.0 Introduction

Transit agencies are constantly seeking to improve service delivery and reduce operating costs. Too frequently, funding constraints preclude expansion of transit services through major capital investments in equipment or infrastructure. Financial constraints have also made it difficult for transit agencies to maintain the levels of investment in equipment and physical plant necessary to provide transportation services that are safe, enhance mobility, and are affordable.

Consequently, transit agencies are interested in identifying and implementing innovative, cost-effective ways to improve transit service. Recognition is growing among the transit industry, which includes transit agencies, manufacturers, suppliers, and vendors of transit equipment, and consultants of the availability of technological applications that can be readily implemented. There is also recognition that more and more technology options are in research and development and will soon be ready for testing and full deployment.

The advent of new computing and communications technologies creates opportunities for transit agencies to make investments that could result in a more effective use of limited funds. That is, the possibility exists for many of the same benefits, such as increased capacity, higher level of service, and improved safety, that have resulted from investments in new vehicles or infrastructure improvements, to be achieved at a lower cost over the long-run with new technological applications.

Transit agencies usually avoid investments in technological solutions that are not proven. To move forward with plans to deploy new technology, these agencies desire proof of its applicability and effectiveness. Clearly, this goes beyond making financial commitments based on testimonials or case studies of best practices. There is strong interest in witnessing the technology deployments first hand, and observing the benefits that different transit agencies have experienced.

Clearly, demand exists among members of the transit community, which includes FTA, transit agencies, manufacturers, suppliers, and vendors of transit vehicles and equipment, consultants, government agencies, elected officials, advocacy groups, and transit riders, for a federally sponsored initiative that:

- Advances the research and development of these technologies in a collaborative manner with manufacturers, suppliers, vendors, and consultants;
- Provides readily accessible demonstrations of the applicability of proven technology and how components from different manufactures can work together to enhance service delivery.

As part of this initiative, technology innovations and best practices that have been advanced by other industries and are applicable to transit operations will be considered. This includes determining how to best tap into these advances and incorporate them into demonstrations and displays that are planned for the Mobile Showcase. The automotive industry is one possible source, given their investment in recent years in research and development, and integration of technologies similar to those that will most probably be under consideration for Mobile Showcase displays.

3.0 Mobile Showcase Mission, Goal, Program Elements, and Benefits

3.1 Mission and Goal

The mission of the APTS Mobile Showcase Program is to promote the development and deployment of transit ITS technology by developing a vehicle that allows the transit community to view and understand available technologies. The Mobile Showcase Program will accomplish this by providing a platform for researching ITS technology integration issues and supporting the continued development of transit equipment integration standards. The Mobile Showcase will use proven state-of-the-art technologies for its mission. Opportunities for demonstrating and researching prototype technologies may also be provided.

This mission is based on understanding that:

- There have been rapid advances in technology development and application;
- Transit agencies want accessible information on technology options and proven solutions;
- The transit industry needs to observe new technology in operation to best determine how it will affect operations;
- Budgetary and time constraints limit the opportunities for staffs of transit agencies and other transportation agencies to attend conferences and lengthy training sessions;
- Transit professionals need timely information about technology and applications;
- ITS requires innovative problem-solving skills, requiring participation of experts from many different disciplines, for deployment;
- There is a need to demonstrate the integration of technologies to improve performance and safety.

The goal of the APTS Mobile Showcase Program is to further the research and the demonstration of integrated technologies and solutions. To meet this goal the Mobile Showcase Program will:

- Research, demonstrate and evaluate the integration of APTS technologies from multiple manufacturers, suppliers, and vendors;
- Promote and demonstrate transit ITS technology;
- Accelerate production and deployment of emerging innovative transit technology;
- Exhibit and provide information that may be helpful in the development of APTS standards;
- Exhibit at major transit and transportation conferences;
- Visit transit agencies as an educational opportunity for the agencies' staffs.

3.2 Key Program Elements and Benefits

The following elements of the Mobile Showcase Program will help meet its goal:

- Convert a transit bus into a mobile showcase and creating an interactive, participatory learning environment that can readily tour the U.S.;
- Secure partnerships with a range of manufacturers, suppliers, vendors, and consultants in the development and installation of the displays, as well as providing instructional in-person resources;
- Present displays and demonstrations that highlight the benefits of proven technologies;
- Present displays and demonstrations of the benefits of emerging technologies that will improve external and internal business processes.

The Mobile Showcase Program will provide a platform for targeted and accessible information. Specifically, it can create a collaborative research and development opportunity for FTA, transit agencies, manufacturers, suppliers, vendors, and consultants to examine the integration issues involved when applying different technologies to improve overall transit service delivery. The Program will demonstrate to the transit community the applicability of advanced technologies, how the technologies can work together, and what benefits can be derived once they have been installed and are fully operational.

The APTS Mobile Showcase will:

- Expose new APTS/ITS technology to a wide cross section of transit agencies and their staffs;
- Demonstrate and advance ongoing research that focuses on the integration of technology for specific applications and problem-solving;
- Research integration standards for APTS/ITS technology and provide lessons learned;
- Illustrate the efficiency and effectiveness of the technology;
- Stimulate increased commitment among transit agencies to evaluate the applicability of different technologies as part of their planning and programming endeavors;
- Establish technology-based solutions more firmly as reasonable and cost-effective alternatives.

3.3 Program Duration

The Mobile Showcase may be in full operation for 24 continuous months and probably for as long as five years. The duration of the Mobile Showcase initiative will be reviewed periodically. Its continuation will be based on the following.

- Saturation: The extent to which targeted groups have been reached, and the major geographical areas of the United States that have been covered.
- Demand for information: This will be dependent on technological advances; the number of interested manufacturers, vendors and suppliers; and the interest levels expressed by the transit community.
- Return on investment: Is the Mobile Showcase resulting in a more informed transit community? Are transit agencies moving forward with deployments? Is the Mobile Showcase resulting in research and development initiatives?
- Cost of operation: The cost of operation (displays, maintenance, transport, staff) needs to be considered versus the feedback that is received from the transit community.

4.0 Program Audience

This section focuses on who needs to be reached, why they need to be reached, and how the APTS Mobile Showcase Program can reach them.

4.1 General Audience Types

The Mobile Showcase needs to be accessible to a diverse audience with different needs and motivations. Potential partners, including manufacturers, suppliers, vendors, and consultants, must see the Mobile Showcase as a useful platform to demonstrate their technologies. Transit agencies must view it as a useful source of information. Technical staffs are interested in a technical resource. Senior management and board members are interested in improving service.

The primary audiences for the Mobile Showcase are transit agencies (transit authority board members, senior staff, technicians) and manufacturers, suppliers, and vendors, of transit technology.

The secondary audience includes:

- Federal, State, and Local Government Officials
- Academia
- Media
- General Public

4.2 Target Audiences

The success of the Mobile Showcase Program is dependent upon knowing who the audience is, and what their needs are. Without this understanding, the likelihood increases that the Mobile Showcase will not be traveling to and on display at the right places and times. It also increases the likelihood that the displays or demonstrations that are included in the Mobile Showcase miss their target audience by not showing people what they want to see or communicating in a way that is meaningful to them.

The target audience includes:

- individuals with decision-making power, such as elected and appointed officials; board members;
- senior and mid-level management;
- management information staff;
- dispatchers;
- schedulers;
- planners and analysts;
- vehicle and equipment operators
- maintenance staff;
- financial staff;
- human resource staff; and
- Marketing staff.

More in-depth descriptions of each of these target groups and their needs are presented in the Mobile Showcase's Communications and Outreach Plan.

4.3 Reaching the Audience

Understanding who the audience for the Mobile Showcase is will influence the scheduling and logistical considerations for the Mobile Showcase (who, what, where and when). While the final decision on matter of purchasing equipment and services is usually vested in a Board or elected representatives, the impetus to invest in technology usually comes from transit agency staff. In the case of the technology to be demonstrated through the Mobile Showcase, it is critical that transit agency management and operation and maintenance staff be attracted to and use the resource provided by the Mobile Showcase.

Transit agency management and staff are interested in how different technologies will solve existing problems, how easily they can be reliably integrated into existing operations, and how reliable these technologies are. In addition, transit and other modal agencies want to learn more about integration possibilities across modes.

To reach this audience, the Mobile Showcase will have to demonstrate how technology can address problems facing transit agencies. The level of technical information must be sufficient to answer questions from technical staff, while being basic enough for senior management and policy makers to understand the benefits and costs of different technologies.

The Mobile Showcase displays need to be accessible to both a technical and non-technical audience. Displays and exhibits should be understandable to both audiences, with information available to address both technical and qualitative issues. The vehicle for adapting the Mobile Showcase to the audience is the staff. By changing the presentation to meet the interests of an audience, the Mobile Showcase staff will serve as the mechanism for adapting to different audiences.

To reach the target audience the Mobile Showcase needs to be made available at:

- Places of work, such as transit agencies (headquarters and maintenance facilities), state departments of transportation, traffic management centers
- National, regional, and local meetings of associations and industry groups (American Public Transit Association (APTA), Community Transit Association of America (CTAA), ITS - America, Transportation Research Bureau (TRB), transit manufacturers meetings, etc.)
- Universities with transportation engineering, urban and transportation planning, communications, and system engineering programs
- Community colleges and vocational schools
- Private and public research centers and extension services
- Legislative sessions
- Public forums

The Mobile Showcase may also serve as a means to highlight new transit technologies through the media. Newspaper, television, and radio reporters will be advised when the Mobile Showcase is arriving in a community. This should be done in a manner that highlights not only the technology, but also the participation of the host, which may be a transit agency, transportation department, other governmental agency, or other partner(s). This is also a means to use the Mobile Showcase to inform the general public about changing transit technologies.

5.0 Mobile Showcase Platform and Technologies

5.1 Platform

This section provides a general description of the platform. The functional technical description is contained within Appendix One. The desired vehicle for use as the Mobile Showcase platform is, at minimum, a 40-foot transit bus. Use of a larger, articulated bus will also be considered. It is not known exactly which displays or vehicle systems will initially be installed on the vehicle, and the number and type of displays will change during the time the Mobile Showcase is displayed. Installed components may or may not be located in the same positions as they would be on an in-service vehicle. For this reason, the exact vehicle specifications cannot be determined at this time, but will be negotiated with prospective vehicle providers.

It is incumbent upon the prospective vehicle provider to work closely with the Mobile Showcase Program Team and also with component providers to determine the vehicle specifications that are appropriate for the component systems that will be installed on the Showcase initially and during the life of the program. The vehicle chosen as the platform(s) will be deemed by the Program Team to be the most appropriate vehicle offered by prospective providers to meet the needs of the program. Vehicle type, availability, cost, support commitment, and other factors necessary to ensure success of the program will determine appropriateness. Based upon the vehicles proposed for use in this program, the Program Team will negotiate with prospective providers to determine appropriate vehicle specifications.

5.1.1 *Intended Use*

The APTS Mobile Showcase will be used to demonstrate the latest available component technologies for transit buses, such as destination signs, passenger counting systems, vehicle locator systems, station annunciation systems, and other similar technologies. These technologies are prioritized in Section 5.2 and described in the Glossary included as Appendix Two. The number and types of these components on the Mobile Showcase will change during the life of the program. It is possible that more than one of a particular type of component, such as two or three station annunciation systems or multiple passenger counting systems, will be installed on the vehicle at the same time to enable comparisons between different manufacturers. The vehicle will be displayed at various venues to be determined during the life of the program.

Some of the component systems to be installed on the Mobile Showcase will include off-vehicle equipment, such as vehicle location/approach indicators and Geographic Information System (GIS) devices that will be used as part of vehicle demonstrations. For this reason, the Mobile Showcase will not be a strictly stationary display, but must be able to operate in a manner that allows demonstration of the installed system(s). This operation will, at a minimum, be on a closed course established at the display site, with enough starts, stops, stations, and other route characteristics to permit satisfactory demonstrations of the component systems installed on the vehicle. At some locations, the vehicle may, subject to agreement of all concerned parties, operate on city streets for the purpose of demonstrating the installed components.

It is anticipated that the vehicle will be transported from site to site on a flatbed trailer. However, in instances where there is a short distance between scheduled events, the vehicle may be driven from one site to the next. For this reason, as well as the fact that the Mobile Showcase may operate in demonstrations on city streets, the vehicle provided must be fully compliant with Federal Motor Vehicle Safety Standards, or subject to appropriate waivers from them, throughout the duration of the demonstration program.

5.1.2 Vehicle Access

A low-floor bus is the preferred vehicle to be used for the Mobile Showcase. This design will allow for easy access/egress during stationary or static displays. As low-floor transit buses are relatively uncommon in the U.S., use of this type of vehicle will, in addition to benefiting the government and the component providers, benefit the vehicle provider, as the vehicle will be displayed at many venues. This public display of the vehicle across the country will enable the vehicle provider to showcase the vehicle to prospective buyers that might not otherwise have the opportunity to view and/or inspect the vehicle first hand. A low-floor model will also significantly improve access to the displayed components for disabled persons.

If a low-floor vehicle is not available or not selected for the Mobile Showcase, a high-floor model will be used. If a high-floor vehicle is selected, the vehicle provider will work with the Program Team and possibly component manufacturers to design a suitable ramp/stair system to facilitate access/egress at display shows.

5.1.3 Support

The vehicle provider selected should demonstrate a level of commitment to support the vehicle for the duration of the program that will help ensure that Program goals are met. Responsibility for the costs associated with the level of support necessary will be negotiated during the selection process. This support will be for the duration of the Program, which is anticipated to be two to five years, and may include:

- Providing the necessary personnel, facilities, and equipment to initially build, refurbish, or otherwise prepare the vehicle for Program start-up;
- Providing any non-proprietary parts lists, maintenance manuals, wiring diagrams, or other required reference materials needed for proper operation, maintenance, repair and other required vehicle functions;
- Working with the Program Team and all proposed component manufacturers to develop vehicle and related equipment specifications for component subsystems that are proposed to be installed on the vehicle and to determine the schedule under which the vehicle will be displayed;
- Providing required spare parts and all necessary materials, tools and equipment, other than specialty equipment and tools pertaining to specific components provided by component manufacturers, to keep the vehicle in good working order, make repairs as needed, and to remove, replace, or install selected components;
- Providing the necessary manpower to operate the vehicle as required;
- Providing the necessary manpower to repair, maintain, refurbish, and reconfigure the vehicle as needed to obtain program goals;
- Providing the necessary personnel to participate in program reviews, public presentations at conferences, workshops and other public forums; and
- Providing other support as needed consistent with the intended use of the vehicle.

5.1.4 Disposition of Bus

During the selection process, the Program Team will negotiate with prospective vehicle providers regarding the disposition of the vehicle at program end. At the conclusion of the Program, the vehicle will be returned to an agreed-upon condition and transferred to the negotiated owner. All components removed from the vehicle prior to this transfer will be disposed of as negotiated with the respective component owners.

5.2 Technologies of Interest

The APTS Mobile Showcase will demonstrate a number of concepts as described by the program's missions, goals, and objectives. To do this, the Showcase will provide for the demonstration of new transit technologies. Some of the items demonstrated will be traditional "high tech" APTS/IVI²/ITS technologies, while others that could be included are defined as "low tech."

The technology for the Mobile Showcase is identified in a list that follows. The list is based on a classification of technology as either "high tech" or "low tech" and the priority (i.e., preferred, desirable, and beneficial) that the Program Team currently places on having the technology included as part of the Mobile Showcase. While the categories reflect the Program Team's current thinking about a technology, potential collaborators may propose any technology that they manufacture or supply.

While every attempt has been made by Program Team to identify all potential technologies, it is recognized that there is the potential for a technology to be omitted. During the evaluation process, all technology proposals will be considered.

A list of the technologies follows. The functional descriptions of each technology and how it can be implemented are provided in the Glossary included as Appendix Two.

² US Department of Transportation Intelligent Vehicle Initiative

5.2.1 High Tech Technologies

Preferred

- Automatic Vehicle Location System (Primary and Secondary - DGPS³ + Another)
- Mobile Data Terminal
- Digital Radio System with Handset
- Silent Alarm & Covert Microphone
- In-Vehicle Logic Unit
- In-Vehicle Sign(s)
- In-Vehicle Annunciator
- Automatic Passenger Counters
- Automated Traffic Signal Priority Request Equipment
- Smart Card Fare Reader & Smart Cards
- Wheelchair Lift (Ramp if Low Floor)
- Pedestrian Detection
- Kiosk
- Dispatch Station
- CAD Software
- Geographic Information Systems (GIS)
- Schedule Adherence Reports

Desirable

- External Announcements
- Remote Diagnostics
- Surveillance Cameras
- Automated Destination Signs
- Night Vision Enhancement
- Collision Warning System
- Adaptive Cruise Control
- Side Warning System for Lane Changing
- Lane Keeping System
- Real-Time Bus Stop Monitors
- Vehicle Tracking Simulation

Beneficial

- Heads-Up Display
- Driving Simulator
- “Black Box” Event Recorders

³ Differential Global Positioning System

5.2.2 Low Tech Technologies

Transit industry representatives are interested in using the Mobile Showcase as a platform to demonstrate “low tech” equipment as well as “high tech” equipment. The following equipment has been specifically identified as being appropriate for inclusion in the Mobile Showcase:

- Vandal Resistant Seats
- Vandal Resistant Windows
- Wheelchair Restraints
- ADA Compliant Stop Requesters

Other low-tech equipment will also be considered.

5.3 Integration

One of the goals of this Program is to identify barriers and issues to integrating equipment, identify ways to overcome those barriers and issues, and show how equipment from different sources can be made to work together. The Mobile Showcase will provide bus and equipment manufacturers, suppliers, vendors, and consultants with the opportunity to identify integration issues related to their equipment and address those issues. The integration issues will be resolved during the participation negotiations with platform and technology providers. Key issues include the following:

- How will technologies be integrated?
- Who will be responsible for integrating the technologies with the bus?
- How will technology refresh occur? Who is responsible? What is the timing or cycle (e.g., every “n” months whenever new technology is available, or on a cycle to allow for a change manufacturer, supplier, or vendor.)
- Documentation: What is documented? Who is responsible?
- Others still to be determined

Many types of technologies may be available on the Mobile Showcase from manufacturers, suppliers, and vendors. Equipment will be changed out on a regular basis on a schedule that will require installation, testing, and training on equipment over a short period of time. A prolonged effort to make equipment work together will reduce the amount of time the Mobile Showcase is available for exhibit.

Once the platform for the Mobile Showcase is determined, the basic standards that will be required for integration as an operational component will be identified. The vehicle will impose spatial, technical, and operational limitations on the number, types, and ways technologies can be demonstrated in an operational mode. The layout of the vehicle may also limit the technologies that can be demonstrated in a display mode.

This will not limit participation by manufacturers, suppliers, and vendors of technologies that do not comply with this standard. It does mean that it may not be possible to demonstrate some equipment in an operational mode. These technologies could, at minimum, be displayed in a simulated operational mode.

6.0 Issues, Outreach, and Strategic Communications

This section focuses on how the Program will reach its intended audience. A detailed “Strategic Communications and Outreach Plan” is being developed and will be provided to active Program participants.

6.1 Issues: Barriers to Implementation

The success of the Mobile Showcase hinges on overcoming the "barriers to entry" listed below. The first step to move this Program forward is securing a vehicle (or vehicles) for the duration of the Program. Any vehicle used as a platform for this Program will be retrofitted so that displays can be readily installed and then disassembled.

The Mobile Showcase Program is designed to be a partnership between the Federal government, transit agencies, and transit equipment manufacturers, suppliers, and vendors. Participation will depend upon the extent that potential partners believe that a targeted and readily accessible Mobile Showcase will enhance recognition for their products and services, and result in transit agencies becoming more proactive in the consideration of technological innovations.

Partnerships must be forged that clearly define their relationship vis-à-vis the Program Team, and the extent of their contribution, both financially and from an information dissemination perspective. Well-defined agreements must be reached on technology displays, the installation of the displays, program delivery, and instructional resources.

Other barriers are grouped below:

- Logistic
 - Projecting the unknown: How long should the Mobile Showcase Program be in operation to achieve desired objectives? When does the Program end?
 - What happens to the Mobile Showcase once the initiative ends?
 - How will the Mobile Showcase be transported from location to location?
 - How will the Mobile Showcase be maintained? How frequently does this need to occur?
 - How frequently will displays and demonstrations be rotated?
 - Who will be responsible for these rotations?
 - Where will the rotations occur?
 - How far in advance do appearances need to be scheduled?
- Strategic Communications
 - What ITS displays or stories need to be headlined?
 - How frequently will displays and demonstrations need to be rotated to provide a comprehensive and coordinated message?
 - What advance publicity and advertising is necessary?
 - What will the publicity consist of (e.g., advertisements, direct-mail campaigns, and journal articles)?
 - What hard copy materials need to be developed in support of the Mobile Showcase and its displays?
 - Who will prepare these materials?
- Staffing Requirements
 - Program coordinator
 - Public relations and marketing coordinator
 - Vehicle maintenance contractor
 - Transporter (carrier) for the Mobile Showcase
 - Personnel to support displays and conduct talks and workshops

6.2 Outreach

6.2.1 Criteria for Selecting Sites

The scheduling the Mobile Showcase for national and regional conferences of organizations, such as, APTA, CTAA, and ITS America, is a major priority. Given the timing and frequency of these conferences, a tour with scheduled stops at "in-between" locations must be pre-determined and coordinated for each region of the continental United States. These would be stops at transit agencies, other transportation agencies, state legislative sessions, and other public forums, which would be anywhere from one to five days in duration.

A distribution of transit agencies should be targeted for the "in-between" stops. This distribution would include:

- Public, private
- Large, medium, and small
- Urban, suburban, rural
- Bus only, multi-modal, rail oriented, mobility oriented

Making a stop at every possible agency or organization in a metropolitan area will be very difficult. For large metropolitan areas, a strategic option would be to select a central place with coordinated visits on dedicated days for other agencies. This would require pre-planning (notification) and scheduling.

Considerations could also be given to selecting locations that will be accessible to the general public. These sites could include a central business district location, shopping districts and malls, expositions, and state and county fairs.

6.2.2 Partners

The APTS Mobile Showcase Program is designed to be a partnership between FTA, the Volpe Center, transit agencies, bus and equipment manufacturers, suppliers, and vendors, consultants, and other interested parties. Any organization committed to advancing the deployment of proven new technologies to improve transit service is invited to participate in this Program. Partnerships must be forged on the understanding that the primary objective is on meeting audiences' needs for information.

While the Mobile Showcase will provide a platform for promoting and even marketing ITS technologies and solutions, it is not intended to be a self-serving tool for participants to sell and sign-on new customers. As part of their commitment, manufacturers, suppliers, and vendors must be interested in supporting the marketing communications objectives for the Mobile Showcase. This includes understanding the needs of the marketplace and providing technology and/or displays which are consistent with meeting those needs.

6.3 Strategic Communications

6.3.1 Demand Analysis: What Displays Does the Market Want?

The Program Team will address the following items in cooperation with interested organizations:

- What displays will best meet the needs of the transit community, and the goals and objectives that have been set for the Mobile Showcase?
- Is there a need for rotating themes during the time that the Mobile Showcase is operating, which will dictate the nature of the individual displays?
- How frequently will each set of displays rotate? (How long the displays will run?)
- Who is going to "script" the displays and work with the partners?

Recent needs assessment research indicates that various segments of the transit audience want information/knowledge about:

- The range of technology options that is available for different projects or applications
- Technologies that are tried and true; the ones that are cutting-edge
- Manufacturers, suppliers, vendors, and consultants who offer quality products, services and expertise
- System design concepts and applications
- Systems integration - making different technologies and systems work together
- Incorporation of ITS technology into a regional concept of operation
- Data management and sharing
- Case studies/demonstrations of best practices

Thus, the displays that are developed for the Mobile Showcase should be more than a "black box" sitting on a table. To effectively demonstrate the benefits of deploying a technology oriented solution to an agency, as well as the ultimate consumer, the displays must:

- Provide information in a quick and “snappy” format, i.e., focused and interactive, with graphical user interface type features
- Demonstrate technology integration
- Demonstrate possible applications
- Demonstrate actual applications, along with testimonials

6.3.2 Meeting the Demand: How Many Buses?

This is dependent upon the number of sites that can be scheduled, the interest that is expressed by targeted audience groups, and the number of manufacturers, vendors, suppliers, and consultants interested and committed to participating.

6.3.3 Information Dissemination Strategy

Public Relations and Communications

- Determine schedule of displays and events in advance based on known priorities, audience, and interest of private sector contributors.
- Issue targeted and tailored announcements through the print media (industry publications), direct mail and FTA staff to transit and transportation properties, national associations, public interest groups, legislators, and executive staff about the availability of the Mobile Showcase. Follow-up with telephone calls or possible visits to confirm "informational needs" and set a schedule for appearances.
- Place articles in national, regional and local newspapers and magazines and trade journals.
- Provide targeted, tailored, and accessible "instructional" resources (recognizing the time and budget constraints that many agencies have for securing training or new information) to satisfy on-demand, just-in-time learning/problem-solving needs.
- Determine support materials: hard copy information for attendees to take with them. Materials must be targeted, topical and appealing.
- Gauge the demand and the effectiveness of developing a web site.
- Consider the development of videos and CDs, which would be used to promote the Mobile Showcase, and to document the range of displays, and presentations that are made during its duration.
- Select staff for the Mobile Showcase who effectively communicate, provide instruction, and conduct demonstrations.
- Plan for and dedicate time each year for educating the ultimate consumer on the benefits of ITS technologies. Consider participating in technology and vehicle expositions.

6.4 Evaluation Framework

6.4.1 Approach

The duration and the success of the Mobile Showcase are dependent upon continuously gauging its appeal among targeted audience groups. Evaluations need to be conducted to discern what the audience is interested in, whether or not the displays or presentations were effective, and determine how to design the next generation of displays. The Program will:

- Create a feedback protocol on the effectiveness of the displays, videos, demonstrations, support material, and instructors. Conduct follow-ups to determine the impact of the Mobile Showcase on planning and programming and identify additional areas where technical assistance is needed. As part of this, the Program Team must:
 - Conduct an evaluation of attendees after each event.
 - Determine the impact of different displays, demonstrations, instructional materials, and instructors.
 - Determine whether or not the displays, demonstrations, and instructional materials are continuing to meet the needs of the targeted audience.
 - Determine if further segmentation of the audience and display materials is necessary.
- Continuously evaluate and modify the Program based on a pre-determined schedule and set of criteria. These evaluations should focus on
 - What technologies/solutions are being considered?
 - What impact did the Mobile Showcase have on project planning, design and implementation among different organizations?
 - How well is the Mobile Showcase continuing to communicate the range of technologies and applications that are available?

6.4.2 Measurements

Consensus must be reached on what to measure. Possible measures include:

- Attendance levels per hour, week, or month; per site; per display.
- Number of times the Mobiles Showcase's web site is visited, particularly during and after a major event.
- Number of inquiries to the Program Team, FTA, or Mobile Showcase partners following a site visit.
- Number of planning and deployment initiatives that are begun after a Mobile Showcase visit.
- Changes in levels of participation from Mobile Showcase partners.
- Technology integration advances and actual deployments versus development, maintenance, and operation costs for the Mobile Showcase.

7.0 Partnerships, Participant Involvement, and Fairness

7.1 Partnerships

The Mobile Showcase Program is designed to be a partnership between government and private organizations. Partners include FTA, the Volpe Center, transit agencies, bus and equipment manufacturers, suppliers, vendors, and consultants. Other organizations interested in furthering the Mobile Showcase Program mission and goal may also participate. The Program Team is willing to work with any organization interested in advancing the deployment of proven transit technology. The Program is designed to be a partnership with all partners working together toward this common goal.

7.2 Participant Involvement

The Mobile Showcase will not succeed unless the Program Team selects and secures the participation of manufacturers, suppliers, vendors, and consultants that have technology, products, or services that correspond with the interests of the target groups. The selection of these partners will depend on their willingness to work with the Program Team in the preparation of displays that will communicate with many different segments of the transit community, and to conform to a predetermined story line. Also, the participants must be willing to design "sets" that can be easily installed and then disassembled.

The number of technologies and products that can be displayed at a given time will be limited. However, this does not mean that information cannot be provided on a large number of products. At minimum, participation requires the willingness to supply equipment, technology, or assistance to the Program. This opportunity will be open to any manufacturer, supplier, or vendor of a technology identified as being appropriate for this Program. Partners would meet only minimal requirements for participation at this level.

Display and integration of technologies will require a greater commitment by partners. A partner would have to provide a piece of technology and train Mobile Showcase staff in how the technology works, in order for staff to demonstrate the technology, and how the technology is maintained. If a technology will be demonstrated as an operational component of the Mobile Showcase, the manufacturer, supplier, or vendor would commit to working with Program staff to integrate the technology into the bus and with other technologies.

Manufacturers, suppliers, and vendors who would like equipment installed on the Mobile Showcase will commit to participate for a minimum length of time. The Mobile Showcase may be out of service for as long as a month to allow for installation of equipment, maintenance, and training of staff. The time between equipment changes will be affected by schedule, interest, and staffing requirements.

7.3 Fairness

The Program Team, which include FTA and the Volpe Center, is concerned that all potential partners are confident that they will be treated fairly throughout their participation in this Program. It is hoped that a large number of technology manufacturers, suppliers, and vendors will be interested in participating in this Program. The Program Team understands that prospective partners may be concerned that their proposal for participation is evaluated fairly and that, as a participant, that they are treated fairly.

To ensure that a variety of partners have the opportunity to participate, technology will be rotated on a regular basis. It is hoped that many manufacturers, suppliers, vendors, and consultants will be interested in participating in this Program and every opportunity will be given to accommodate them. Criteria for participating have been established and are included in an Invitation to Participate in Cooperative Research and Development Agreements. A copy of this invitation is available through the Commerce Business Daily (web and hardcopy), the FTA web page (www.fta.dot.gov), or by contacting Matthew Rabkin, Mobile Showcase Program Manager, at:

US DOT
Volpe National Transportation Systems Center
55 Broadway, DTS-49
Cambridge, MA 02142
e-mail: rabkin@volpe.dot.gov
fax: 617-494-3260
voice: 617-494-2151

8.0 Operations and Maintenance

8.1 Staffing

The Volpe Center manages the APTS Mobile Showcase Program for the FTA. Volpe Center staff will be responsible for scheduling the Mobile Showcase, negotiating terms of participation, working with partners, and overseeing installation of equipment. It is anticipated that the staff assigned to the Mobile Showcase will be knowledgeable about both the types of equipment demonstrated on the Mobile Showcase and the specific technologies installed for demonstration purposes.

8.1.1 Technical Staff (Presenters)

When the Mobile Showcase visits a site it will be necessary to have sufficient staff available to present the technologies and equipment to visitors. The physical configuration of the Mobile Showcase will determine the minimum staff needed. If, for example, demonstration of some equipment were done off the bus, a staff person would need to be available both on and off the bus.

Staffing must be adequate for the number of visitors expected at a given site, and to provide back up if a staff person becomes ill or for other reasons has to leave a site unexpectedly. Based on the experience of the FHWA Commercial Vehicle Operations (CVO) Trailer, it appears that the minimum staff necessary when the Mobile Showcase is at a public event, like a trade show or conference, will be three people. Based on this same experience a staff of two may be sufficient when the Mobile Showcase visits some sites, such as a visit to a transit agency.

8.1.2 Driver

There are three scenarios where an experienced driver's services will be needed.

- A driver may be needed when the bus is being transferred between exhibit events and is not being towed or trailered. A driver for this type of movement will be either part of the Program Team or contracted from a local transit agency or from a bus transportation services provider.
- A driver may also be needed when moving the bus into a stationary exhibit at a major conference or trade show. Movement of this type would be done either by the driver of the trailer towing the bus, by a member of the Program Team, or by a driver working for the local transit provider. "Spotters" from the Program Team would assist the driver and, if required, the exhibit services company.
- Some interest has been expressed in operating the Mobile Showcase in simulated revenue service. This would require a driver would operate the bus on either city streets or on a closed course. It is hoped that the local transit provider would provide a qualified driver for this purpose. If no local driver were available, the Program Team would locate (either directly or through the programs' partners) a qualified driver.

8.1.3 Support/Mechanics/Technicians

The Volpe Center, as part of the Program management effort will provide the administrative support staff. Mechanics and technicians will be provided by a Program partners, the Program Team, and contracted support. The details will be part of the negotiations between the government and the Program partners.

8.1.4 Staff Qualifications

While all staff will be the most qualified available to the Program, presentation staff will need to have, at minimum, good interpersonal skills, a knowledge of APTS/ITS technology, and an overall understanding of the Program mission and goal. Technical staff's qualifications will be negotiated between the Program Team and the Program partners.

8.1.5 Training Requirements

Staff training will be the combined responsibility of the Program Team and the partners. The responsibilities will be defined in the cooperative agreements.

8.2 Scheduling

Scheduling of specific events will be based on Program priorities, budgetary constraints, the interest of the Program partners, the locations of major transportation conferences, and requests from other organizations. See the section entitled "Criteria for Selecting Sites" in Section 6 for further discussion on scheduling of the Mobile Showcase.

8.3 Technology Refreshment and Replacement

8.3.1 Fairness to Participants

As with the initial selection of Program partners/collaborators, the selection of those included during the technology replacement intervals will be based on selection criteria that will be both beneficial to the government and fair to the Program partners.

8.3.2 Efficient and Effective Scheduling

Scheduling for technology refreshment and replacement will be based on timing that works with the Program exhibit schedule as well as continuing to make all decisions fair to the needs of the Partners and in the best interest of the government.

8.4 Movement (Drive or Tow)

Until the vehicle(s) that will serve as the Mobile Showcase platform is chosen, it is not known if the vehicle will need to be towed or driven from location to location. It is clear that any vehicle that is included in the Program will need to be able to move under its own power either for demonstrations or to be moved into exhibit halls and transit maintenance facilities.

8.5 Maintenance

It is hoped that all major maintenance for the Mobile Showcase will be covered by the manufacturer's warranty. The Program is exploring partnerships with APTA and individual transit agencies in order to provide scheduled minor maintenance. It is hoped that, for the Program's duration, no item requires major non-warranty maintenance. On the road maintenance and basing issues will be addressed after a vehicle or vehicles are made available and a schedule is established.

9.0 Closeout

Disposition of equipment at the end of the Program will be based on agreed upon terms and conditions defined in the agreements with Program partners. It is anticipated that at scheduled equipment change-outs, equipment will be returned to providers.

In order to demonstrate that this Program met its objectives and provided expected benefits, it is necessary to build practices into the Program from the start that allow for Program evaluation. Information will be collected throughout the Program on issues ranging from customer satisfaction to issues identified when integrating equipment to equipment operation. Mobile Showcase staff will document lessons learned throughout the Program and make this information available to partners in the Program.

Throughout the program there will be a number of evaluation measures used to examine the program. Included in these evaluations will be documentation that will include lessons learned and benefits accrued. These will be reported in white papers, technical articles and other reports. Additionally, specific information gathered through the research of integration issues and further development of industry standards will be provided to the Program partners as well as the larger transit industry.

Appendix One

APTS Mobile Showcase Program Plan Platform Functional Technical Description

1 General Platform Information

The desired vehicle(s) for use as the APTS Mobile Showcase platform is, at minimum, a 40-foot transit bus. Use of a larger, articulated bus will also be considered. It is not known exactly which displays or vehicle systems will initially be installed on the vehicle, and the number and type of displays will change while the Mobile Showcase is displayed. Installed components may or may not be located in the same positions as they would be on an in-service vehicle. For this reason, the exact vehicle specifications cannot be determined at this time, but will be negotiated with prospective vehicle providers.

It would be best for the bus to be completely gutted in the interior to allow for the design and installation of displays. A bus that has no seats, wall panels, carpet, lighting, or other interior components will provide easy access to the bus's electrical system. To facilitate design and installation of Mobile Showcase displays, full sets of plans, design prints, and electrical and Heating, Ventilation, and Air Conditioning (HVAC) schematics should be made available. It would also be helpful if a contact person from the bus manufacturers who is familiar with the bus is made available for technical assistance.

It is incumbent upon the prospective vehicle provider to work closely with the Mobile Showcase Program Team and also with component providers to determine the vehicle specifications that are appropriate for the component systems that will be installed on the Showcase initially and during the life of the Program. The vehicle chosen as the platform(s) will be deemed by the Program Team to be the most appropriate vehicle offered by prospective providers to meet the needs of the Program. Vehicle type, availability, cost, support commitment, and other factors necessary to ensure success of the Program will determine appropriateness. Based upon the vehicles proposed for use in this Program, the Program Team will negotiate with prospective providers to determine appropriate vehicle specifications.

2 Intended Use

The APTS Mobile Showcase will be used to showcase the latest available component technologies for transit buses, such as destination signs, passenger counting systems, vehicle locator systems, station annunciation systems, and other similar technologies that are now and will become available for installation on transit coaches. The number and types of these components on board the Mobile Showcase will change during the life of the Program. It is possible that more than one of a particular type of component, such as two or three station annunciation systems or multiple passenger counting systems, will be installed on the vehicle at the same time to enable comparisons between different manufacturers.

The vehicle will be displayed at various venues to be determined during the life of the Program. In as much as the purpose of the APTS Mobile Showcase Program is to display the state-of-the-art in transit vehicle technologies, it is anticipated that the vehicle will be displayed at nationally attended events. These could include such venues as American Public Transit Association (APTA) workshops, conferences and expositions, ITS events, congressionally attended events, and other venues selected for high visibility to the transit community and to the public at large.

Some of the component systems to be installed on the Mobile Showcase will include off-vehicle equipment, such as vehicle location/approach indicators and Geographic Information System (GIS) devices that will be used as part of vehicle demonstrations. For this reason, the Mobile Showcase will not be a strictly stationary display, but must be able to operate in a manner that allows demonstration of the installed system(s). This operation will, at a minimum, be on a closed course established at the display site, with enough starts, stops, stations, and other route characteristics to permit satisfactory demonstrations of the component systems installed on the vehicle. At some locations, the vehicle may, subject to agreement of all concerned parties, operate on city streets for the purpose of demonstrating the installed components. If the vehicle provider determines that the provider's personnel can only operate the vehicle, the provider shall have the necessary staff available to operate the vehicle as needed during each display period. The vehicle provider will be required to provide training for the safe and proper operation of the vehicle by other personnel authorized to operate the vehicle.

It is anticipated that the vehicle will be transported from site to site on a flatbed trailer. However, in instances where there is a short distance between scheduled events, the vehicle may be driven from one site to the next. For this reason, as well as the fact that the Mobile Showcase may operate in demonstrations on city streets, the vehicle provided must be fully compliant with Federal Motor Vehicle Safety Standards, or subject to appropriate waivers from them, throughout the duration of the demonstration Program.

3 Vehicle Access

A low-floor bus is the preferred vehicle to be used for the APTS Mobile Showcase. This design will allow for easy ingress/egress during stationary or static displays. As low-floor transit buses are relatively uncommon in the U.S., use of this type of vehicle will, in addition to benefiting the government and the component providers, benefit the vehicle provider, as the vehicle will be displayed at many venues. This public display of the vehicle across the country will enable the vehicle provider to showcase the vehicle to prospective buyers that might not otherwise have the opportunity to view and/or inspect the vehicle first hand. A low-floor model will also significantly improve access to the displayed components for disabled persons.

If a low-floor vehicle is not available or not selected for the Mobile Showcase, a high-floor model will be used. If a high-floor vehicle is selected, the vehicle provider will work with the Program Team and possibly component manufacturers to design a suitable ramp/stair system to facilitate access/egress at display shows. Wheelchair access ramps may be incorporated into the bus design at the factory level. If ramps are designed independently, storage and transport issues will need to be addressed along with the design of the vehicle interior.

4 Fuel/Propulsion

In accordance with current and proposed Federal policies, the Program Team encourages manufacturers of alternative fueled vehicles, including diesel-electric hybrid, to consider participation in the Program. For safety reasons, some fuels, such as compressed or liquefied natural gas, may not be appropriate if the vehicle is to be displayed indoors. Prospective providers should identify the vehicle propulsion system proposed and provide detailed information relating to fuel safety. Vehicles proposed for the APTS Mobile Showcase will not be “experimental,” but will have demonstrated the ability to be operated in a manner consistent with successful operation of the vehicle in the type of service anticipated during static and active displays. During the life of the Program, the vehicle provider will work with the Program Team to ensure adequate fuel availability at the scheduled sites.

If the vehicle uses propulsion batteries, the vehicle provider must provide sufficient technical information on the safety of the batteries used, especially as pertaining to indoor use, storage, and charging of the battery system. All pertinent Society of Automotive Engineers (SAE), Underwriter's Laboratory (UL), and National Fire Prevention Association (NFPA) codes, recommendations and requirements must be met by the batteries and all on-board and off-board battery and charging related equipment.

5 Vehicle Interior

The vehicle interior will change throughout the duration of the Program as component systems are added and removed. The provider will work with the Program Team and the component manufacturers to finish out the vehicle for each show in a manner that is consistent with a first-rate demonstration vehicle. It is incumbent upon all parties to ensure that the vehicle is, at all times, kept in a neat, clean, and professionally-appointed condition any time it is used for display. There will be sufficient time scheduled between events to allow for maintenance, repair, retrofit, installation and removal of components, cleaning and servicing of the vehicle to ensure that it is ready for the next venue.

At times, the bus interior may serve as a "virtual bus" stationary display, where several component systems are installed in the bus interior and people walk through to view and/or operate them.

Materials selected for the vehicle trim and interior should be chosen on the basis of maintenance, durability, appearance, safety, flammability, and ease of alteration and modification. There will be no wires, hoses, or other similar materials left exposed when components are installed. Also, there will be no sharp or abrasive edges or surfaces and no unnecessary hazardous protuberances.

6 Seating

Depending on the operation of the vehicle at any given show (i.e., static display, demonstration within a closed course, or simulated revenue service) and the type and number of component systems installed, the number and location of seats will vary. The vehicle provider will work closely with the Program Team, any exhibit design contractor(s) hired by the Program Team, and the component manufacturers to determine the number, type, and layout of seats for different show configurations; seats must be firmly and securely fastened to the vehicle. Although the vehicle will not be used for regular revenue service, an appropriate number of wheelchair tie-down locations will be installed, as well as a wheelchair lift if the vehicle is a high-floor model and a wheelchair ramp in a low-floor model.

7 Electrical Interfaces

The vehicle will be equipped with a varying number and type of component systems during the life of the Program. For this reason, an exact vehicle electrical interface specification cannot be determined at this time. All of the components that will be installed, however, are or will be designed for transit coach installation, and will be operated on standard bus power, 12V DC, 24V DC for most components or up to 220 V AC (with possible transient voltages above this) for other components such as fluorescent lighting fixtures. For component systems that require power other than is available on a standard transit coach, the component manufacturer and the vehicle provider will work together with the Program Team to determine the power requirements for that equipment. No systems will be installed on the vehicle that are deemed by the Program Team to have the potential to cause fire or other damage to the vehicle and installed or on-board equipment.

It is incumbent upon the Program Team, the vehicle provider, and component suppliers to work closely together to determine vehicle electrical requirements for each configuration proposed for display in a timely manner prior to the scheduled event(s) for that configuration. There may be instances where the systems planned for installation may exceed the available vehicle power, and the Program Team will limit on-board systems in this event so as not to jeopardize the vehicle or any persons coming in contact with the vehicle. While all of the components to be installed are intended for use in standard transit coaches, the quantity, location, and operation of these systems will likely require more power than a typical revenue service transit bus. Therefore, the vehicle provider should anticipate that power requirements will be higher than normal, and plan accordingly. In all cases, the vehicle power generating system shall be rated higher than the total electrical load imposed on the system. All circuits shall be protected by circuit breakers (or fuses where it can be demonstrated that circuit breakers are not suitable) and shall have electronic/electronically sufficient ground wires, with separate ground wires for ac, dc, and signal uses. All wiring, connectors, components, connections, etc. shall meet the specification requirements of SAE, as appropriate.

It is possible that the vehicle engine will not be able to be run indoors at display sites. Since the on-board component systems will be operated while the vehicle is indoors, the vehicle must be able to provide sufficient power to operate these systems. It is anticipated that standard 110 VAC 60 cycle single phase and/or 208/240 VAC 60 cycle single-phase power will be available at the display locations. The vehicle should be able to connect to these types of power and convert it into suitable power for the on-board systems.

The vehicle electrical system should be designed in a modular fashion to minimize the amount of re-wiring that would be needed when on-board systems are removed and/or replaced. To this extent, the Program Team, the vehicle provider, and the proposed component providers will meet to discuss potential power requirements at the onset of the Program.

8 Heating Ventilation and Air Conditioning

The vehicle should be equipped with a suitable heating/air conditioning system. The intended use of the vehicle will most likely subject it to the range of climate conditions found throughout the country at all times of the year. The vehicle will also most likely need to be cooled during indoor displays. The Heating Ventilation and Air Conditioning (HVAC) system should run off of the vehicle power system while the vehicle is operating and should also be able to be cool the bus while indoors and the vehicle is plugged into the available power at the display location.

9 Support

The vehicle provider selected should demonstrate a level of commitment to support the vehicle for the duration of the Program that will help ensure that goals are met. Responsibility for the costs associated with the level of support necessary will be negotiated during the selection process. This support will be for the duration of the Program, which is anticipated to be two to five years, and may include:

- Providing the necessary personnel, facilities and equipment to initially build, refurbish or otherwise prepare the vehicle for Program start-up;
- Providing any non-proprietary parts lists, maintenance manuals, wiring diagrams or other required reference materials needed for proper operation, maintenance, repair and other required vehicle functions;
- Working with the Program Team and all proposed component manufacturers to develop vehicle and related equipment specifications for component subsystems that are proposed to be installed on the vehicle and to determine the schedule under which the vehicle will be displayed;
- Providing required spare parts and all necessary materials, tools, and equipment, other than specialty equipment and tools pertaining to specific components provided by component manufacturers, to keep the vehicle in good working order, make repairs as needed, and to remove, replace, or install selected components;
- Providing the necessary manpower to operate the vehicle as required;

- Providing the necessary manpower to repair, maintain, refurbish, and reconfigure the vehicle as needed to obtain Program goals;
- Providing the necessary personnel to participate in Program reviews, public presentations at conferences, workshops and other public forums; and
- Providing other support as needed consistent with the intended use of the vehicle.

10 Disposition of Bus

During the selection process, the Program Team will negotiate with prospective vehicle providers regarding the disposition of the vehicle at the end of the Program. At that time, the vehicle will be returned to an agreed-upon condition and transferred to the negotiated owner. All components removed from the vehicle prior to this transfer will be disposed of as negotiated with the respective component owners.

APTS MOBILE SHOWCASE PROGRAM PLAN STRAWMAN DRAFT
APPENDIX TWO
DETAILED FUNCTIONAL REQUIREMENTS OF TECHNOLOGY

1.0 INTRODUCTION

Each section is highlighted with integration considerations to help manufacturers understand the interface architecture and the common systems that will be available to assist in demonstration of their technology. These integration considerations are not only to provide a seamless look to the APTS Mobile Showcase, but to address some important transit platform integration issues. A common interface that integrates with a number of other systems enhances a product's potential as a multi-functional player. Ultimately resolving these issues will not only improve a product, but more importantly, it will make this product more acceptable to a transit operator.

2.0 ADAPTIVE CRUISE CONTROL

An advanced form of cruise control that adjusts the vehicle's speed to maintain an appropriate spacing from the vehicle that it is following.

Integration Considerations: Systems using identical sensor technology will have to be selectable and manufacturers are strongly encouraged to provide data and display information via a common bus or standard electronic interface.

3.0 AUTOMATED DESTINATION SIGNS

Bus route and destination sign at the top front of the bus which is changed electronically based upon the route assignment of the bus (stored in the in-vehicle units memory) and its position and direction.

Integration Considerations: Obviously a very limited number of external signs can be mechanically mounted to the bus. However, if it is decided to swap out several manufacturers' signs, each manufacturer will be responsible for designing an easily removed and replaced mounting scheme. Also, is highly desired that the manufacturer make provisions to allow for an interface to the common computer to control the sign display.

4.0 AUTOMATED TRAFFIC SIGNAL PRIORITY REQUEST EQUIPMENT

On-board equipment that initiates communication with traffic signals at intersections outfitted for providing priority treatment for authorized vehicles. Priority treatment for buses can be automatic or based upon their schedule adherence condition.

Integration Considerations: It would be preferred that any bus external interfaces or equipment be common to more than one manufacturer. However, this will be handled on a system-by-system basis.

5.0 AUTOMATIC PASSENGER COUNTERS

Devices placed at the bus entrances and exits to automatically record the number of passengers getting on and off the bus at each stop. Devices normally use either pressure sensitive mats or infra-red beams to count boardings and alightings.

Integration Considerations: Data provided from these systems should be made available to a common data bus or the common computer for sharing with dispatch or other systems. For example, passenger counters can be closely coupled with smart card detection to set alarms if someone has not properly registered at the reader. Also, passenger information may be retransmitted regularly to dispatch and thus need to be shared with the selected communications device.

6.0 AUTOMATIC VEHICLE LOCATION SYSTEM (PRIMARY AND SECONDARY - DGPS + ANOTHER)

A system of locating a bus while it is in motion. Several methods of bus location determination are possible: calculations of longitude and latitude from global positioning satellites signals received (GPS); calculations of longitude and latitude from long range aid to navigation signals received (LORAN-C); distance traveled from last signpost passed (signpost and odometer); and gyrocompass and distance traveled (inertial navigation). In most cases a combination of two methods will be needed to be able to locate a bus at all times due to signal loss, signal distortion, odometer inaccuracies, etc.

Integration Considerations: A single GPS antenna solution is highly desired, and participants are encouraged to establish a method for interfacing with a common antenna system. Most AVL systems require a high quality display. A common display may be used to demonstrate products from several vendors. Participants are encouraged to establish a method for providing these video signals to the common display. Additionally some other systems may use the position and time solution for passenger notification or dispatch tracking. Participants are encouraged to offer common data access through a defined data port. Provisions may be made for systems requiring access to a CD or DVD Map storage medium. Accommodations may be provided for remotes and touch screen input methods as required.

7.0 CAD SOFTWARE

Software packages that convert the data coming from the buses to a form suitable for display on the dispatcher's screens as well as facilitating communications with the bus operators. (this can include the capability to log and record incidents and work with AVL systems)

Interface Considerations: Consideration should be given to maximizing the use of open systems hardware and software architecture.

8.0 COLLISION WARNING SYSTEMS (CONSISTING OF INDIVIDUAL SUBSYSTEMS)

8.1 Lane change/merge/passing collision avoidance system

Includes: sensors placed appropriately on perimeter of vehicle, as well as warning devices on driver display

8.2 Rear end/forward collision avoidance system

Includes: sensors placed appropriately on perimeter of vehicle, as well as warning devices on driver display

8.3 Rear impact mitigation/warning and recording system

Includes: sensors placed appropriately on rear perimeter of vehicle, as well as warning devices on driver display, warning display on rear of vehicle and camera or other recording system and ancillary data storage/display.

Integration Considerations: Systems using identical sensor technology will have to be selectable, and manufacturers are strongly encouraged to provide data and display information via a common bus or standard electronic interface.

8.4 Precision docking/tight maneuvering system

Includes: sensors placed appropriately on perimeter of bus, as well as automated guidance for vehicle

Integration Considerations: Systems using identical sensor technology will have to be selectable, and manufacturers are strongly encouraged to provide data and display information via a common bus or standard electronic interface.

8.5 "Black Box" safety event recording

Similar event recorders have been called for in light rail vehicles.

Integration Considerations: Data will be provided via a common vehicle bus system, and data collected by event recorders should be provided via a common bus to the common computer and/or display for demonstration purposes.

8.6 Pedestrian detection system

Although the technology has not yet matured, there are prototype tests being performed on school buses.

Integration Considerations: Systems using identical sensor technology will have to be selectable, and manufacturers are strongly encouraged to provide data and display information via a common bus or standard electronic interface.

9.0 DIGITAL RADIO OR CELLULAR SYSTEM WITH HAND/HEADSET

A radio or cellular system which transmits communications between operator and dispatch, and possibly street supervisors, in digital form. Communications can be in either voice or data. Voice communications requires a handset for operators to talk to dispatchers or street supervisors. This could include Cellular Digital Package Data (CDPD), a system that uses the cellular telephone network to send and receive data from either fixed or mobile locations.

Integration Considerations: These systems will likely require an external antenna. The manufacturers (partners) will be expected to help choose any antenna that can be used for multiple vendors to ensure a minimal of vehicle antenna clutter or RF interference.

10.0 DISPATCH STATION

An arrangement of equipment used by the dispatchers in performing their functions in the dispatch center. Normally there would be two monitors, one showing a map of the service area with bus locations and associated information indicated, and the second displaying various operator and bus information and radio communication requests. Radio equipment would also be included at the station.

Interface Considerations: Manufacturers are encouraged to provide suggested interface techniques for these communications devices and recommend acceptable industry standards for the receipt and transmission of bus or dispatch data.

11.0 DRIVING SIMULATOR

A compartment with a projection screen showing the route which the bus is taking and the driver's seat, controls, and equipment for visitors to perform the actions that the driver performs in an APTS fleet management system.

Interface Considerations: None

12.0 EXTERNAL ANNOUNCEMENTS

Voice announcements to passengers waiting at the bus stop of the route and destination for the bus.

Integration Considerations: Same as internal announcements, except they must be able to receive information from bus or dispatch center.

13.0 GEOGRAPHIC INFORMATION SYSTEMS (GIS)

GIS can be used in several ways that enhance transit operations including system and route planning, customer information systems, demand response operations, etc. GIS, therefore, can be included in the Mobile Showcase, not as software, but as it has been implemented to assist transit operations.

Interface Considerations: Map data will be the responsibility of the GIS supplier. Detailed map data for various information and or traffic systems may be made available via the common computer in standard GIS formats. (e.g., Navtech, SDAL, ESRI, Caliper, etc.)

14.0 HIGH SPEED AND LOW SPEED DATA BUS TECHNOLOGIES

Several candidate data bus technologies are under active consideration by the ITS, and the goal of the Mobile Showcase is to demonstrate the value of having common data bus structures which integrate systems and help share vital information for a number of important systems. This technology is divided into two categories, one being a lower speed vehicle information bus and the other a high-speed multimedia bus having the bandwidth and capacity for full video.

Integration Considerations: The manufacturer for these data bus(es) would be required to help integrate the various systems and show the data bus technology as a viable candidate.

15.0 HEADS-UP DISPLAY

Device used to project information from the vehicle's control or operating systems into the motorist's view without obstructing the train operator's view or causing the operator to take his/her eyes from the vehicles path.

Interface Considerations: Limited space is available to install heads up systems. Manufacturers are encouraged to provide strategies for temporary mounting or quick removal and replacement techniques.

16.0 IN-VEHICLE ANNUNCIATION

Voice annunciation of the same information displayed on the in-vehicle sign.

Integration Considerations: Common systems may be available to assist in the integration of voice announcements. This could include providing event keying, from the common platform, or other relevant bus status information. The common computing system may be equipped with voice recognition and other voice interactive functions.

17.0 IN-VEHICLE SIGN(S)

A device inside the bus which displays messages on a small screen such as next stop location and transfer possibilities, but which can also display the names of nearby shops, restaurants, and public facilities, as well as paid advertisements. Signs may be placed in more than one location on the bus.

Integration Considerations: In addition to “standard” transit signs, consideration is being given to the use of flat panel display technology. Flat panels, possibly touch screens, may be strategically mounted to offer passenger kiosk interfaces for various passenger information systems. Displays should make provisions for transmitting data on a common video bus or at a minimum providing raw video signals to the common computer.

18.0 IN-VEHICLE UNIT

An onboard computer that can calculate the bus location from information received, determines and reports schedule adherence, controls voice and data messaging, sends alarm signals to dispatch, and collects and stores data for external review and processing. (It can be a component of an AVL system as well as calculate engine information, e.g., RPM, oil pressure, etc., and interface with smart card and APC systems.)

Integration Considerations: Vehicle Data Elements may be provided via a common interface device or a common data bus. Any display information would preferably use the common display system provided. The common computing system may be available for any required off-line calculation or data from other systems.

19.0 KIOSK

A stand containing a screen which can display a variety of different types of transit information to potential customers depending upon which menu choices they choose.

Interface Considerations: Manufacturers will be encouraged to provide suggested interface techniques for these displays and recommend acceptable industry standards for the receipt and transmission of bus or dispatch data. Off-vehicle kiosks (for use in transit facilities or at stops) can operate independently and, as designed, only need to interface with bus systems.

20.0 LANE KEEPING SYSTEM

A system which recognizes the roadway lane that the bus is in and interfaces with the steering mechanism to keep the bus within the lane.

Integration Considerations: Systems using identical sensor technology will have to be selectable, and manufacturers are strongly encouraged to provide data and display information via a common bus or standard electronic interface.

21.0 MOBILE DATA TERMINAL

A device placed near the bus operator which can receive and display text messages on a small screen and which can be programmed to send pre-set messages to the dispatch center by pushing specific buttons on the keypad. Messages are sent between operator and dispatch via a radio data channel.

Integration Considerations: It is understood that many Mobile Data Terminals have embedded displays and keyboards and depending on the number of such products selected for the APTS mobile showcase it is possible that these systems will be fully integrated into the driver area. However, manufacturers are encouraged to offer solutions which can interface with the common display to provide the cleanest “look and feel” for the audience. Common computing and display systems may be provided which can easily interface with communications systems and any particular video output that will ensure an effective presentation of the product.

22.0 NIGHT VISION ENHANCEMENT

Technology that provides enhanced vision for the vehicle operator during darkness, fog, or other conditions that limit the operators' vision. Night vision enhancement provides information from an infra red/low light camera or other device and can be displayed on a video screen or heads-up display.

Integration Considerations: Consideration should be given to providing the video output of this system to the common display, to minimize the proliferation of specialized screens throughout the driver area.

23.0 REAL-TIME BUS STOP MONITORS AND OTHER ARRIVAL NOTIFICATION METHODS

Electronic signs or other devices such as pager or hand-held device notification or internet information which display real-time information concerning the buses serving that bus stop location. The sign indicates an estimated arrival of the next bus or the next several buses for each route passing the stop.

Interface Considerations: Manufacturers are encouraged to provide suggested interface techniques for these displays, and recommend acceptable industry standards for the receipt and transmission of bus or dispatch data.

24.0 REMOTE DIAGNOSTICS

Sensors placed on bus components to monitor mechanical, electrical, and fuel systems from a remote location in order to identify and prevent potential bus malfunctions and service breakdowns. (It can monitor systems and subsystems, including oil pressure, brake wear, engine RPM, temperature, transmission, etc.)

Integration Considerations: All vehicle information will likely be obtained from a common interface device or a common data bus. All required data should be obtained from one of these devices. A common display and computing system is available as required for warning and message display.

25.0 SCHEDULE ADHERENCE REPORTS

Display the types of reports that an APTS fleet management system is capable of producing.

Interface Considerations: Manufacturers providing these solutions will be responsible for adapting systems to the established data transmission and protocol standards.

26.0 SILENT ALARM & COVERT MICROPHONE

A button located in an inconspicuous position which, when pushed, sends a signal to the dispatch center that there is some emergency on-board the bus. The dispatch center can open a microphone on the bus that allows personnel or staff to listen to what is happening on the bus in order to determine what response action is needed. (It can be part of an AVL or radio system.)

Integration Considerations: These systems may require both a cellular and/or a GPS antenna, and it is strongly desired that a common GPS and cellular antenna be used. The selection of these standard antennas will be based on including input from all users. The common computer and data bus system will provide these systems any vehicle information including vehicle position or vehicle disposition (as required). Similarly these systems may use a common cellular transmission system or a stand-alone solution.

27.0 SMART CARD FARE READER & SMART CARDS

Integration Considerations: Although most cards and readers will be a closed system, consideration must be given for interfacing the passenger and fare information to other systems. For example, dispatch or displaying status on the common display terminal. Also, smart card systems may need information from other onboard systems (e.g., APC) or other vehicle information (e.g., is the door open or closed, or is the bus moving or at a stop?). Considerable thought must be given to using a common data bus or a standard electronics interface.

Solution providers or VARs should assist in helping to establish manufacturer's hardware that could be made common to several solution providers to ensure the best use of limited space for mounting sensors.

Smart Card technology is a complicated subject. It is therefore treated with more detail than the other technologies.

27.1 On-Vehicle Components:

27.1.1 Fare Card Transaction Processor (FTP) : FTPs can be deployed on buses to process fare payment, automatic and customer requested point-of-use revaluing and card function blocking/option changing transactions. Fare payment and revalue transactions can occur automatically on-board vehicles. Some operator/seller intervention may be required to handle some processes.

FTP's can have the following components, regardless of location and installation.

- CPU and software to support all the functions of the FTP;
- Data storage component, including battery back-up;
- Contactless fare card interface device;
- Passenger visual display (fare category, card balance and alarm messages);
- Audio indicator with distinct tones for correct fare payment;
- Input/output ports;
- External power supply;
- Internal clock

27.1.2 Fare Payment - Stored Rides: A period pass is typically the first fare payment method that the FTP will look for followed by stored rides and stored value. If a valid period pass is not stored on the fare card the FTP will look for valid stored rides. If valid stored rides are not detected, the transaction processor will proceed to look for available stored value. Provided the stored rides are valid the fare payment transaction can occur:

27.1.3 Fare Payment – Store Value: If a valid period pass or valid stored rides are not detected by the FTP, the FTP will read the fare category setting from the fare card and match it to the fare table to determine the appropriate stored value fare.

27.1.4 Transaction and Balance Information: FTP display units can provide transaction and card information to the customer and driver/seller. This information can include:

- Remaining Value Display
- Low-Value Display Signal
- Insufficient Value/Display Signal
- Blocked Card Display/Signal

27.1.5 High Speed Fare Card Encoder: All fare cards can be purchased from a card manufacturer pre-encoded with a unique serial number. The cards can also be prepared for initialization with pre-encoded components for fare initialization and revaluing. The fare cards can have the following components in memory:

- unique serial number;
- fare category component;
- a component for period pass;
- a component for stored rides;
- a component for stored value;
- a component for automatic revalue provisions;
- a component for commercial account privileges;
- a component for fare card status;
- a component for transaction data storage;

27.1.6 Data Acquisition and Communications System: Data acquisition systems consolidate and transfer data between the clearinghouse and the transaction processors on the transit vehicles. Typically, data upload and download to the transit buses occurs when the vehicles return to their bases. For vehicles that do not return to the base each day another method of transferring data will need to be designed.

27.2 Off-Vehicle Components:

27.2.1 Fare Card:

- The fare card can include an embedded microchip, antenna and capability to provide contactless communications with the FTP.
- The fare card may include security measures to ensure data security, transaction processor/fare card authentication and to provide various levels of access control to data components stored on the fare card.
- The fare card may not include any source of power to drive the microprocessor and the communications, but shall obtain power from the FTP.

27.2.2 Fare Card Architecture:

Physical Standards: Fare card media should conform to the following standards:

- Basic physical standards as defined by the International Standards Organization (ISO) Standards 7810 and 7813.
- Specific physical standards for integrated circuit cards with contacts defined in ISO 7816-1 and 7816-2.
- Specific physical standards for contactless integrated circuit proximity remote coupling cards specified in ISO 14443-1 (currently in Draft status). In instances where this emerging standard (ISO 14443) modifies or constrains other ISO standards in order to accommodate the contactless functionality, such modifications shall apply to the fare card.

27.2.3 Card Operating Standards (COS): The COS shall comply with the electrical requirements set forth by ISO 7816 and Europay, MasterCard and Visa (EMV) standards.

- The COS shall support a multi-application structure to allow transit agency(s) to create and add new applications without interfering with existing applications. If multiple applications are used in conjunction with an open electronic purse, then any application added to the fare card should be subject to the approval of the open electronic purse associated to ensure the integrity of the open purse scheme.
- The COS shall allow the updating and/or removal of existing applications.

27.2.4 Functionality of Fare Card:

Payment Options: Various Fare Payment Options exist and may include stored value, stored ride, and transfers.

Electronic Purse Accommodations: provide the requirement to conform to current and emerging payment system standards being developed and piloted by various bank card associations around the world.

27.2.5 Card Interface Device (CIDs):

Contactless CIDs need to specify to Contractor/Equipment provider how the CIDs are to be read and encoded through the contactless interface.

Passenger Display/Indicator: Display shall be easily read under any combination of lighting, including direct sunlight and nighttime operation;

- At a minimum what messages will be provided:
- Fare amount deducted;
- Remaining value on the card;
- Indication of unsuccessful transaction such as “Invalid read/encode – Try Again”, “Insufficient Value”, “Invalid card – Call Service Center”;
- Message indicating the CID is not operational “OUT OF SERVICE”;
- Indicators that the fare card has a low remaining value “LOW VALUE”.

Data Communications Interfaces: Communication modules may be provided using a standard interface such as PCMCIA slot. Hardware and data requirements must also be specified for interaction between CID and other transit agency(s) equipment such as fare gates. Additional, requirements will need to be stipulated for Standalone CID, Fare Gate CID, and On-Board CID.

Configurations: CID configurations shall be provided by the contractor to the train operator for the following: On-Board CID, Stand-alone CIDs and other CIDs including faregates.

Fare Card Interface/Contactless CID: The fare card-CID contactless interface shall meet ISO 14443 Standards. Card –CID interface requirements should also include Reader-to-Card and Card-to-Reader. Additional specifications should include initialization and anti-collision protocol, transaction protocol, operating range, and processing throughput.

On-Board Sub-Systems: CIDs installed on-board buses should be able to operate in conjunction with other subsystems including wireless data communication systems, optional automated vehicle location (AVL) systems, and driver console.

27.2.6 Card/Ticket Vending Machines/Kiosks:

Dispensing Fare Card: Kiosks can be equipped with a supply of pre-initialized anonymous base fare cards. Additionally the customer can select a new fare card option on the kiosk display and then be prompted to enter his/her value selection. The kiosk can then calculate the cost of the revalue. The cost can include a nominal card fee. Customers will then be prompted to provide payment. Once the kiosk has received payment the card will be revalued and the card will be dispensed.

Fare Card Revalue – Payment by Credit/Debit Card at Kiosk: Fare Card revalue can be paid by credit/debit card.

Fare Card Revalue at Kiosk by Cash: Fare card revalue can be processed at the kiosk by cash.

Distribution Devices: Distribution devices support the sales of fare cards, the loading of fare cards with stored dollar value, stored pass and rides, and the encoding of these cards with birth dates, or other relevant data as needed to support transit agency discount fare calculations.

- Add Value Machine (AVM)
- Electronic Purse Load Machine (EPLM)
- Card Vending Machine (CVM)
- Ticket Office Terminal (TOT)

Bill Acceptance Unit: Typically, bill acceptance units accept \$1, \$5, \$10, \$20 bills, U.S. currency, insert in any orientation. The bill acceptance system shall have an escrow unit. Acceptance of each denomination of bills shall be enabled or disabled by software commands transmitted from the remote computer system controlling or monitoring the Distribution Device.

Coin Acceptance/Return Unit: Typically, coin acceptance/return units accept the following U.S. coins: nickels, dimes, and quarters. The coin acceptance/return system can be programmable and reconfigurable to accept coins other than those listed.

Card dispenser: Typically card dispensers are a unit that has been used in other industries, such as financial services, that requires no modification. The unit can be designed to be modular and designed to facilitate easy maintenance and revenue servicing.

28.0 SURVEILLANCE CAMERAS

Video or digital cameras strategically placed on the bus which can record activities which take place on-board for later review and possible management or police action.

Integration Considerations: The camera system participant should consider providing an interface to a high-speed multi-media bus or at a minimum offering a raw video output. Although video switching equipment could be provided by a separate participant, adding this to any camera system would be a welcomed advantage. Video camera images may be provided via a common display.

29.0 VEHICLE TRACKING SIMULATION

Presentation of a bus schedule on a map screen that simulates buses moving along their routes at many times their actual speed. This tool can be used for schedule updates and service planning.

Interface Considerations: Manufacturers providing these solutions will be responsible for adapting systems to the established data transmission and protocol standards.

30.0 WHEELCHAIR LIFT (RAMP IF LOW FLOOR)

A wheel chair lift is a mechanical device, operated by the bus driver, which will raise and lower a person in a wheelchair between ground level and the bus floor. If the bus is a low floor model, the driver deploys a ramp for the wheelchair person to use.

Integration Considerations: Our goal is to maximize the number of manufacturers represented. If there are multiple wheelchair lift/ramp vendors, it is desirable that a quick remove and replace strategy be developed. Mechanical solutions may be provided to suit any compromises required for a non-permanent installation. (Safety is always paramount; therefore, if this is not practical, an off-vehicle display strategy may be developed to accommodate multiple vendors.)

COOPERATIVE RESEARCH AND DEVELOPMENT AGREEMENT

BETWEEN

U.S. DEPARTMENT OF TRANSPORTATION
RESEARCH AND SPECIAL PROGRAMS ADMINISTRATION
VOLPE NATIONAL TRANSPORTATION SYSTEMS CENTER

AND

FOR

ADVANCED PUBLIC TRANSPORTATION SYSTEMS
MOBILE SHOWCASE

This Cooperative Research and Development Agreement (the "Agreement" or "CRADA") is entered into pursuant to the Federal Technology Transfer Act of 1986 (15 U.S.C. 3710 et seq.) and Section 5102 of the Transportation Equity Act for the Twenty-First Century (23 U.S.C. 502(b)(2)), by and between (the "Collaborator"), and the United States of America (the "Government"), acting through the Research and Special Programs Administration Volpe National Transportation Systems Center (the "Volpe Center"), a federal laboratory within the U.S. Department of Transportation, located at 55 Broadway, Cambridge, MA, 02142.

The Volpe Center has been established by the U.S. Department of Transportation ("DOT") as the national center for research and analysis in the areas of transportation and logistics including the evaluation, development, and transfer of technologies critical to the safety and efficiency of all modes of the nation's transportation system. In support of these goals, the parties agree as follows:

ARTICLE 1

1. Covered Activities

1.1 Purpose. The purpose of this project is to meet the responsibilities of the DOT's Federal Transit Administration (FTA) to demonstrate and stimulate deployment of advanced technologies to improve transportation services. To this end, the FTA has tasked the Volpe Center with development of the Advanced Public Transportation System (APTS) Mobile Showcase Program. The APTS Mobile Showcase will provide a platform for demonstration of advanced transit technologies, for research to identify and address issues arising from the integration of different technologies and technologies from different manufacturers, and for bringing these technologies to the attention of public transit agencies. This project will also help in the on-going development of standards for advanced transit technologies. Development of standards will reduce both the risks to a transit agency of acquiring a specific technology and the costs to acquire that technology.

1.2 Scope. It is agreed that all activities under this Agreement are to be performed on a best efforts basis.

1.3 Term of Agreement. This Agreement shall be effective as of the date of execution and shall continue in effect for 60 months or until terminated in accordance with Article 6 hereof.

ARTICLE 2

2. Definitions

2.1 The term "data" means recorded information, regardless of form or the media on which it may be recorded, including technical data, computer software and documentation.

2.2 The term "Collaborator Equipment" or "Equipment" means personal property, equipment and technology (including computer software) as described in Appendix A hereto, delivered to the Volpe Center for use in connection with the Mobile Showcase Program.

2.3 The term "FTA" means the Federal Transit Administration of the U.S. Department of Transportation.

2.4 The term "Mobile Showcase" means one or more platforms for integration and display of Advanced Public Transportation Systems (APTS) equipment, including transit buses and other types of exhibits for APTS technology.

2.5 The term "proprietary information" means any information or data which embodies trade secrets developed at private expense or confidential data which is determined to be exempt from disclosure under the Freedom of Information Act, 5 U.S.C. §552, and which is provided by a Collaborator or Third-party Collaborator under this Agreement.

2.6 The term "Third-party Collaborators" means parties with whom the Government or the Collaborator have entered into a contract or agreement (including another CRADA) involving work to be carried out in connection with activities under this Agreement.

ARTICLE 3

3. Obligations of the Parties

3.1 Contributions of the Government. During the term of the Agreement, the Volpe Center shall provide the following services:

Select the equipment/technology to be exhibited.

Coordinate the installation and integration of the APTS technology onto the Mobile Showcase. Coordinate equipment maintenance and changes to the displays.

Manage, schedule, and publicize the display and exhibition of the Mobile Showcase at transit industry conferences and individual transit operators' locations.

Inform the Collaborator of the Mobile Showcase schedule.

3.2 Contribution of the Collaborator. During the term of the Agreement, the Collaborator shall:

Provide Collaborator Equipment as described in Appendix A to this Agreement.

Provide technical assistance in the installation and integration of the Collaborator Equipment into the Mobile Showcase.

Provide training in operation and routine maintenance of the Collaborator Equipment used in the Mobile Showcase.

Provide informational and/or educational materials such as brochures and videotapes for distribution to interested parties.

Provide upgrades, non-routine maintenance and replacement of Collaborator Equipment included in the Mobile Showcase.

3.3 Participation in Exhibitions. With the prior agreement of the Government, the Collaborator may be authorized to participate directly in Mobile Showcase exhibitions.

3.4 Disposition of Collaborator Equipment. Unless otherwise stated herein in writing, the Collaborator agrees that it will not seek the return of Collaborator Equipment other than transit buses provided under this Agreement. At the Government's option, such equipment may remain indefinitely in the buses used in the Mobile Showcase, after termination of the Mobile Showcase Program.

3.5 Americans with Disabilities. The buses and associated equipment used in the Mobile Showcase shall conform to the requirements of the Americans with Disabilities Act, as amended, 42 U.S.C. §§ 12101 *et seq.*

3.6 Buy America. It is intended that the transit buses as exhibited in the Mobile Showcase will conform to U.S. preference requirements as described in 49 U.S.C. § 5323(j) and FTA regulations found at 49 C.F.R. Part 661.

3.7 National Standards. It is intended that all Collaborator Equipment selected for inclusion in the Mobile Showcase will conform to the ITS National Architecture Standards.

3.8 Protection of Human Subjects. To the extent applicable, any research under this Agreement shall be carried out in accordance with the common Federal Policy for the Protection of Human Subjects and implementing Department of Transportation regulations, found at 49 C.F.R Part 11

ARTICLE 4

4. Management

4.1 CRADA Managers. The Director of the Volpe Center and the Collaborator have each appointed a CRADA Manager, responsible for administering this Agreement. The CRADA Managers are identified in Appendix B hereto.

The CRADA Managers shall meet from time to time to review the ongoing and proposed collaborative activities. With input from the Collaborator, the Volpe Center CRADA Manager shall establish priorities and schedules, and shall attempt to resolve any disagreements arising under this Agreement.

Any unresolved disputes shall be dealt with in accordance with Article 7.

4.2 Security, Safety and Accident Prevention

Collaborator employees and other persons acting on behalf of the Collaborator with respect to this Agreement shall conform at all times to all applicable safety rules and requirements and shall take all reasonable steps and precautions to prevent accidents and preserve the life and health of Collaborator and Government personnel, visitors to the Mobile Showcase, and members of the general public.

Any violation of applicable security or safety rules or related directions of the Volpe Center CRADA Manager shall be grounds for immediate termination of the Agreement.

ARTICLE 5

5. Proprietary Data

a) The Collaborator shall make its best efforts to label appropriately any proprietary data it furnishes to the Government under this Agreement.

b) The Collaborator agrees not to knowingly disclose to others or make use outside of this Agreement of any proprietary data and information belonging to others, and appropriately marked, which the Collaborator obtains as a result of activities under this Agreement.

c) Pursuant to 15 U.S.C. §3710a(c)(7)(A), any proprietary information which embodies trade secrets developed at private expense or a confidential information, which is determined to be exempt from disclosure under 5 U.S.C. §552, and which is obtained by the Government as a result of activities under this Agreement, shall not be disclosed by the Government without written authorization of the owner.

ARTICLE 6

6. Termination

a) The parties may terminate this Agreement at any time by mutual consent. Either party may unilaterally terminate this Agreement by giving 180 days notice in writing to the other party, in accordance with Article 9.6.

b) The termination of this Agreement by either party for any reason shall not affect the rights and obligations of the parties accrued prior to the effective date of termination, except as mutually agreed to in writing.

c) Upon termination of this Agreement, at the Government's sole option, the Government may direct the Collaborator to remove its Equipment at its own cost, or may require that the Collaborator's Equipment remain on the platform in which it has been integrated. In the latter case, Collaborator shall make no claim of title to the Equipment, but shall have no further responsibility to maintain or replace it.

ARTICLE 7

7. Disputes

7.1 Dispute Resolution. Any dispute arising under this Agreement which is not disposed of by agreement among the CRADA Managers shall be submitted to the Director of the Volpe Center for resolution. A decision of the Volpe Center Director shall be the final disposition of any dispute arising under Article 4.

7.2 Continuation of Work. Pending the resolution of any dispute pursuant to this Article, the parties agree that performance of all obligations shall be pursued diligently.

ARTICLE 8

8. **Liability**

8.1 **Property.** The Government shall not be responsible for damage to any Collaborator Equipment provided pursuant to this Agreement, including personal property owned by third-parties and provided or installed by Collaborator or Third-party Collaborator personnel, except to the extent that such damage arises from the negligence of Government employees and Government liability for such damage is permitted under the Federal Tort Claims Act.

8.2 **Warranty.**

a) The Collaborator warrants that it is the owner of the Collaborator Equipment and that it has the right to provide the Equipment to the Government without infringement on the property rights of others.

b) Except as specifically stated otherwise, neither party makes any express or implied warranty as to any matter whatsoever, including the condition of the Collaborator Equipment.

8.3 **Indemnification.** The Collaborator agrees to indemnify and hold harmless the Government for any loss, claim, damage, or liability of any kind, involving Collaborator Equipment or employees or invitees of the Collaborator, or any party acting on its behalf or under its authorization, which arises directly or indirectly out of activities under this Agreement.

ARTICLE 9

9. **Miscellaneous**

9.1 **No Benefits.** No member of, or delegate to the United States Congress, or resident commissioner, shall be admitted to any share or part of this Agreement, nor to any benefit that may arise therefrom; but this provision shall not be construed to extend to this Agreement if made with a corporation for its general benefit.

9.2 **Governing Law.** The construction, validity, performance and effect of this Agreement for all purposes shall be governed by the laws of the United States.

9.3 Entire Agreement. This Agreement constitutes the entire agreement between the parties concerning the subject matter hereof and supersedes any prior understanding or written or oral agreement relative to said matter.

9.4 Amendments. If either party desires a modification in this Agreement, the parties shall, upon reasonable notice of the proposed modification by the party desiring the change, confer in good faith to determine the desirability of such modification. Such modification shall not be effective until it is incorporated herein by a formally executed written amendment to this Agreement.

9.5 Assignment. Neither this Agreement nor any rights or obligations of any party hereunder shall be assigned or otherwise transferred by either party without the prior written consent of the other party. Any attempted assignment is void.

9.6 Notices. All notices pertaining to or required by this Agreement shall be in writing and shall be directed to the CRADA Managers identified in Appendix B.

9.7 Independent Contractors. The relationship of the parties to this Agreement is that of independent contractors and not agents of each other or joint-venturers or partners.

9.8 Severability. If any provision of this Agreement is held invalid, the remainder of the Agreement shall not be affected thereby and shall remain in full force and effect.

9.9 Use of Name or Endorsements. Neither party shall use the name of the other in any advertising or other form of publicity without the prior written permission of the other. The Collaborator shall not in any way imply that this Agreement is an endorsement by the Government of any Collaborator Equipment or related service.

IN WITNESS WHEREOF, the Parties have caused this Agreement to be executed by their duly authorized representatives as follows:

For the Collaborator:

By: _____

For the Government: U.S. DEPARTMENT OF TRANSPORTATION
RESEARCH AND SPECIAL PROGRAMS ADMINISTRATION
VOLPE NATIONAL TRANSPORTATION SYSTEMS CENTER

By: _____
Richard R. John, Director

Date:_____

Appendices A and B

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Evaluation Criteria

1.0 Vehicle Platform Proposed

- 1.1 *Appropriateness of vehicle* – Are the vehicles offered for the APTS Mobile Showcase Bus the most appropriate vehicles available to meet the needs of the program? Appropriateness will be determined by vehicle type, installed equipment, fuel type, availability, condition, cost, support commitment, and other factors necessary to ensure success of the program. Is the offeror willing to negotiate with the Government to finalize specifications for the configuration of the initial vehicle and for all subsequent equipment and/or component modifications?
- 1.2 *Vehicle provider business history and financial capability* – How long has the vehicle provider been in business? Has the provider any history of support to similar projects? Does the provider have the expertise and staff to support the program? Does the provider have the financial capability to fulfill its obligations to the program for three to five years?

2.0 Equipment and Technologies Proposed

- 2.1 *Type of equipment and technologies* – Are the equipment and technologies proposed consistent with those identified in the program plan?
- 2.2 *Complementarity of equipment and technologies* – How well will the equipment and/or technologies proposed by the respondent complement that offered by others to form a workable and integral Mobile Showcase unit or units?
- 2.3 *Integration* – How much Government effort will be required to integrate the respondent's equipment and technology with that proposed by others?
- 2.4 *Alternative equipment and technologies* – Has the respondent proposed alternative equipment and technologies to be provided if, for whatever reason, the proposed equipment and technologies are not available for any reason, e.g., manufacturing delays.
- 2.5 *Evidence of reliability* – Has the vendor/component a track record? If this is not a proven technology, what support will be available from the vendor?

- 2.6 *Compliance with national architecture standards* – The project will use national architecture standards. Does the product or technology meet these standards or does the vendor state how it will assist the Government in integrating its product or technology into an environment that does use these standards.
- 2.7 *Technology “refresh”/“Change-out”* – Has the respondent included a refresh/change-out plan for their technology?

3.0 “In-kind” Contributions to Program

- 3.1 *Training* – Has the respondent identified how it will provide training and/or staff to assist in operation and maintenance of the Mobile Showcase? Will the training provided be sufficient for the Showcase staff to properly present the equipment and to address basic operation and maintenance of the equipment?
- 3.2 *Product and Education Materials* – What materials will the respondent provide to describe and explain the equipment. Will the Showcase Program be able to use any materials offered?
- 3.3 *Value of In-kind Contributions* – Are any in-kind contributions proposed by the respondent of value to the APTS Mobile Showcase Program? How well will the in-kind contributions proposed by the respondent complement those offered by others to form a workable and integral Mobile Showcase unit or units?

4.0 Financial Contribution to Program

- 4.1 *Financial Support for Operations and Maintenance* – To what extent will the respondent provide financial support for operations and maintenance or other aspects of the APTS Mobile Showcase?
- 4.2 *Commitment and timing* – Is there a clear, firm commitment and schedule for the financial contribution?

5.0 Interface with Other Respondents

- 5.1 *Cooperation* – Has the respondent clearly and unambiguously indicated a commitment to work with other respondents on the APTS Mobile Showcase?

6.0 Schedule

- 6.1 *Schedule* – Is the schedule proposed (for equipment and technologies, financial contributions, and in – kind contributions) consistent with the overall APTS Mobile Showcase schedule?
- 6.2 *Schedule risk* – Is there schedule risk and/or uncertainty in the respondent's proposed schedule?
- 6.3 *Complementarity of Schedules* – How well will the schedule proposed by the respondent complement the schedule of other respondents?

Note: These criteria notwithstanding, the Government reserves the right to select as a collaborator any respondent whose proposal is deemed to be advantageous to the program.